



Prosthetic Rehabilitation of Orbital Defect with Undercut Retained Orbital Prosthesis - A Case Report

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Abstract

Orbital defect may be seen in case of congenital abnormality, severe trauma or disease such as an infection, tumor or any malignancy. The loss of eye is associated with psychological trauma, physical problems, and a poor quality of life. Rehabilitation of orbital defect with prosthesis in such patients will improve the appearance as well as psychological status of the patient. This article describes prosthetic rehabilitation of orbital defect in 46 year old male patient who had lost his left eye due to mucormycosis infection post covid.

Keyword: Orbital Defect, Orbital Prosthesis, Prosthetic Rehabilitation, Orbital.

Introduction

The loss of any facial structure or tissue negatively impacts patient's psychological, physical, social health. As the face and eyes represent a person and who they are, the loss of an eye can be a very traumatic event in a person's life, not only medically, but also emotionally. Mutilation of a portion of a face can cause a heavy impact on the self- image and personality of an individual. Surgical removal of an eye is a severe handicap to a patient because the most important sensory organ of communication is lost. [1]

These orbital defects are restored by surgical reconstruction and followed by placement of orbital

prosthesis. According to GPT 9 “Orbital prosthesis can be defined as a maxillofacial prosthesis that artificially restores the eye, eyelids, and adjacent hard and soft tissues.” Rehabilitation of orbital defects acts as a boon for such patient and helps in giving an acceptable and life-like appearance and also improves the overall health of the patient.

Depending on the severity of the defect Orbital prosthesis are accordingly fabricated in patients for rehabilitation. This case report details the clinical management of a patient following enbloc removal of an eye. Fabrication of a sectional two piece orbital prosthesis and the challenges faced during fabrication has been explained in this article. [2]

Case report

A 46 year old male having orbital defect came to the Department of Prosthodontics in Pandit Deendayal Upadhyay Dental College, Solapur for replacement of his left eye defect. Medical history revealed that patient was tested positive for COVID 19 on July 2021 for which he was hospitalized. During the hospital stay, in second week he developed painful swelling of left eye with increased lacrimation. He was evaluated and diagnosed to have orbital cellulitis secondary to fungal sinusitis with uncontrolled type 2 diabetes (i.e. Rhino orbital mucormycosis).

He underwent extensive debridement of left orbit with temporalis muscle flap on august 2021. Within few days he noticed pain and mobility with gingival inflammation of his left maxillary arch and he was diagnosed with rhino maxillary mucormycosis and underwent for hemi maxillectomy along with zygomatic process and anterior, posterior, palatal wall of maxilla on October 2021. After recovery he has done maxillary interim removable prosthesis from local dentist. He was further referred to

our institution to the department of prosthodontics for prosthetic rehabilitation for left orbital defect on February 2022. (Fig 1&2)

Extraoral Examination:-

- Symmetry-Bilaterally asymmetrical face
- Shape-roughly ovoid shaped defect
- Dimention-height-5.5cm x Width-5cm x Depth-2.5cm
- Communication with nose and maxila
- Loss of zygomatic prominence.



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2

Fig:- 1 & 2: Orbital Defect

Treatment plan

Prosthetic Rehabilitation of orbital defect with orbital prosthesis was planned to restore the defect.

Fabrication of orbital prosthesis involved the following treatment:-

1. Facial moulage to study the defect and plan the treatment.
2. Selection of stock acrylic eye shell and wax sculpting.
3. Stabilization of the eye shell.
4. Selecting suitable prosthetic material, Shade matching.
5. Processing of Prosthesis & Finishing Polishing.
6. Insertion of the prosthesis.

Facial moulage Fabrication

To study the case in detail, a full facial impression from forehead region to nose was made with the patient in an upright position and the remaining right eye passively closed. The area was boxed with modelling wax. The deep defect communication area in between orbital cavity and oral cavity was blocked with wet gauze. Irreversible

hydrocolloid was mixed and painted gently into the defect area and over the closed right eye. Further mixes were made and the entire boxed area was filled. Wet gauze was placed over the hydrocolloid as it was reaching its final set. (Fig.3)

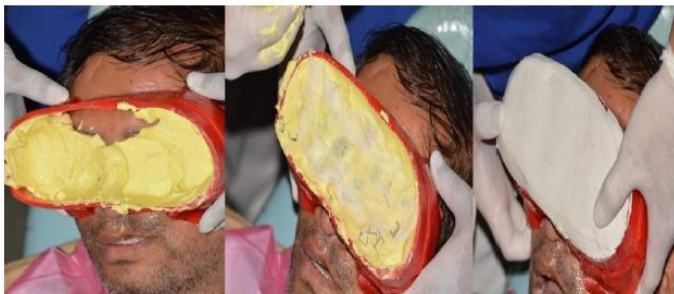


Fig.3: Fabrication of Facial moulage.

Dental stone was mixed and applied over the gauze to stabilize the impression during the cast pouring procedure. The facial moulage and base was made with type III gypsum product. This was used as the working model to study the defect site. (Fig 4).

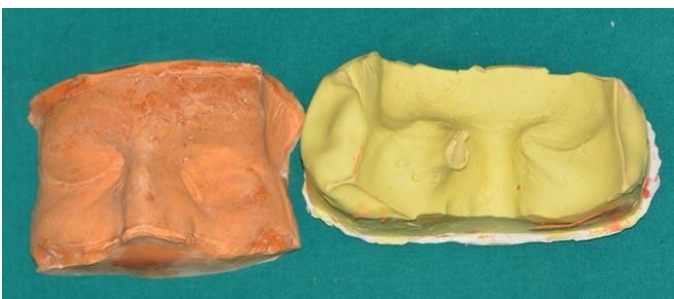


Fig. 4: Facial Study model to study defect site.

Selection of stock acrylic Eye Shell and wax sculpting

The periorbital anatomy of the right eye was drawn with an indelible marker on graph paper. Tissue contours like the shape of the upper and lower eye lids, interlid space, and the brow shape were marked on the graph paper. The transparent tracing was inverted and oriented on the defect side. This was used to sculpt the wax pattern of the orbital prosthesis as the tracing represented the mirror image of the right eye. Eye shell matching the size and color of sclera and iris of the patient's right eye was selected from an array of stock acrylic eyes. The working

cast was filled with wax and the eye shell was oriented on it

(Fig.5).The eye shell position, the lid aperture of the orbital prosthesis was assessed.

The wax pattern thus formed was tried on the patient defect area (Fig 6). Correct mediolateral, antero-posterior, inferosuperior positioning and central axis of the prosthesis were confirmed on the patient's face. Once patient's approval was obtained, the pattern was transferred for processing.



Fig.5 & 6: Selection of Eye Shell and Wax Pattern.

Stabilization of the eye shell

The difficult task in fabricating an orbital prosthesis is maintaining the position of the eye shell without positional discrepancy during processing. The hub of needle was attached to Eye shell with the help of clear acrylic auto-polymerizing resin.

Silicone prosthesis processing

After finalizing the pattern, flasking and de-waxing was done in the conventional manner.(Fig.7)



Fig. 7: Flasking and Dewaxing of Wax Pattern.

The room temperature vulcanizing (RTV) silicone (techno vent) was coloured according to patient's skin colour using intrinsic stains and was packed into the mould, and left for 16 hours.(Fig 8)



Fig. 8

Prosthesis insertion

Patient was called for Prosthesis insertion after finishing and polishing of the prosthesis. Adhesive was applied to prosthesis the patient was taught to insert the prosthesis (figure 9 & 10).



Fig. 9 & 10: Insertion of final Orbital prosthesis

The mechanical retention provided by the undercut. Patient was advised to continue the use of his reading glasses which further helped to camouflage the margins of the prosthesis. The patient was very much satisfied with the aesthetic result of the prosthesis. The patient commented that the prosthesis made him feel confident and removed the sense of insecurity (Fig 11 & 12)



Fig. 11 & 12: Before and after orbital prosthesis insertion appearance

Discussion

The techniques discussed in the case report ensure that prosthetic rehabilitation restore the patient anatomy as

normal as possible and helped the patient to regain the self- confidence assuring an improvement in the quality of life.

An accurate impression reproducing the details of the defect is the prime requisite for a successful prosthesis. A selection of ideal maxillofacial prosthetic material and reliable retentive aid paves the way for a better aesthetic and functional outcome. Since 1960, Medical grade silicone remains superior to other maxillofacial prosthetic materials due to their desirable material properties including flexibility, biocompatibility and ability to accept intrinsic and extrinsic colorants, chemical and physical inertness, and ease to mould. To retain a prosthesis, several methods have been recommended including adhesives, conformers, use of mechanical undercuts (anatomically present or surgically created), and Osseo integrated implants with attachments such as magnets, ball, and ring or bar and clip. The advantage of prosthetic rehabilitation is creation of a “life-like appearance” of the prosthesis, minimum surgical intervention, and ease of clinical observation of the affected site.

Conclusion

The prime factors that need to be considered for a final outcome include accurate impression of the defect should be made, selection of proper material, and technique for the fabrication of prosthesis. This helps to recover confidence and self-esteem in today's cosmetically challenging world. As a Prosthodontist our aim should be to render the best service possible to the patient in regard to the restoration and continuity of the defect to its most natural form.

References

1. Pisulkar SK, Dahihandekar C, Rajpurohit H, Mistry R. Prosthetic rehabilitation of orbital defect owing to

- surgical management of rhabdomyosarcoma. J Datta Meghe Inst Med Sci Univ 2020;15:312-6.
2. Bindhoo YA, Aruna U. Prosthetic rehabilitation of an orbital defect: A case report. The Journal of Indian Prosthodontic Society. 2011;11(4):258.
 3. Binit S, Goveas R, Thaworanunta S. Rapid fabrication of silicone orbital prosthesis using conventional methods. Singapore Dent J 2014;35:83-6.
 4. Mathews MF, Smith RM, Sutton AJ, Hudson R. The ocular impression: A review of the literature and presentation of an alternate technique. J Prosthodont. 2000;9:210–6.
 5. Guttal SS, Patil NP, Nadiger RK, Rachana KB, Dharnendra, Basutkar N. Use of acrylic resin base as an aid in retaining silicone orbital prosthesis. J Indian Prosthodont soc. 2008;8:112–115. doi: 10.4103/0972-4052.43615.
 6. Kale E, Mese A, Izgi AD. A technique for fabrication of an interim ocular prosthesis. J Prosthodont. 2008;17:654–661.
 7. Supriya M, Ghadiali B. Prosthetic rehabilitation of a patient with an orbital defect using a simplified approach. J Indian Prosthodont soc. 2008;8:116–118.
 8. Shetty S, Mohammad F, Shetty R, Shenoy K. Prosthetic rehabilitation of an orbital defect for a patient with hemifacial atrophy. The Journal of the Indian Prosthodontic Society. 2016 Jan;16(1):91.